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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,365	04/11/2006	Munetaka Watanabe	Q78082	9055

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SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	
HSIEH, HSIN YI	

ART UNIT	PAPER NUMBER
2811	

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05/13/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/575,365	WATANABE, MUNETAKA	
	Examiner	Art Unit	
	Hsin-Yi (Steven) Hsieh	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 January 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-9 and 12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-9 and 12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 January 2009* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. **Claims 1, 4-9, and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibata et al. (JP 2003-163373 A) in view of Uemura et al. (US 6,936,859 B1).

4. Regarding **claim 1**, Shibata et al. teach a flip-chip-type (paragraph [0005]) gallium nitride compound semiconductor light-emitting device (paragraph [0007]) comprising a substrate (11; Drawing 2, paragraph [0013]), an n-type semiconductor layer (n-type layer 13; Drawing 2, paragraph [0013]), a light-emitting layer (the layer 14 containing the layer which emits lights; Drawing 2, paragraph [0016]), and a p-type semiconductor layer (p type layer 15; Drawing 2, paragraph [0013]), wherein a negative electrode (n electrode 19; Drawing 2, paragraph [0016]) provided on said n-type semiconductor layer (13; see Drawing 2), and a positive electrode (p

type electrode 28 and 2nd reflecting layer 27; Drawing 2, paragraph [0017]) provided on said p-type semiconductor layer (15; see Drawing 2), the n-type semiconductor layer (13), the light-emitting layer (14), and the p-type semiconductor layer (15) being successively provided atop said substrate (11) in this order (see Drawing 2) and being composed of a gallium nitride compound semiconductor (paragraph [0013]), wherein said positive electrode (27 and 28) has a three-layer structure (2nd reflecting layer 27 and p type electrode 28, and 28 can be a bilayer; paragraph [0009, 0011]) comprising an ohmic electrode layer (2nd reflecting layer 27 of Rh which forms ohmic contact; Drawing 2, paragraph [0009, 0017]) composed of rhodium (paragraph [0017]) which is in contact with said p-type semiconductor layer (15; Drawing 2), and a bonding pad layer (p type electrode 28 can be Au, which is a well known bonding pad material; Drawing 2, paragraph [0011]) and being composed of a metal selected from the group consisting of gold, aluminum, nickel, and copper, or composed of an alloy containing at least one of these metals (Au, i.e. gold; paragraph [0011]); wherein the bonding pad layer (28) is provided atop (on top of) a portion (the portion at the right hand side) of the ohmic electrode layer (27), wherein said portion is less than the entirety of the ohmic electrode layer (27; see Drawing 2).

Shibata et al. do not teach an adhesion layer composed of titanium which is provided on said ohmic electrode layer and has a thickness of 1000 Å to 3,000 Å, and a bonding pad layer provided on said adhesion layer, and wherein the adhesion layer has the same dimension as the bonding pad layer.

In the same field of endeavor of light emitting diode, Uemura et al. teaches an adhesion layer (second positive electrode layer 122 made of Ti; Fig. 10, col. 12, lines 43-49) composed of titanium (col. 12, lines 43-49) which is provided on said ohmic electrode layer (first positive

electrode layer 121 made of Rh; Fig. 10, col. 12, lines 43-49), and a bonding pad layer (third positive electrode layer 123; Fig. 10, col. 12, lines 43-49) provided on said adhesion layer (122; see Fig. 10), and wherein the adhesion layer (122) has the same dimension as the bonding pad layer (123; see Fig. 10). Uemura et al. also teach an adhesion layer (122) has a thickness of 3 Å to 1000 Å (col. 13, line 44), which overlaps the claimed range of 1000 Å to 3,000 Å, and this establishes a prima facie case of obviousness (see MPEP 2144.05).

Uemura et al. also teach the multi-layer structure can provide a high reflectivity and a large durability against moisture, and a simplified protection layer (col. 5 lines 4-8).

It would have been obvious to one of ordinary skill in the art at the time of invention was made to combine the inventions of Shibata et al. and Uemura et al. and use the multi-layer positive electrode as taught by Uemura et al., because the multi-layer structure can provide a high reflectivity and a large durability against moisture, and a simplified protection layer as taught by Uemura et al.

5. Regarding **claim 4**, Uemura et al. also teach said ohmic electrode layer (121) has a thickness of 100 Å to 3,000 Å (3000 Å; col. 12, lines 43-49).

6. Regarding **claim 5**, Uemura et al. also teach said ohmic electrode layer (121) has a thickness of 0.01 μm to 5μm (i.e. 100 Å to 50,000 Å; col. 13 lines 31-34), which overlaps the claimed range of 500 Å to 2,000 Å, and this establishes a prima facie case of obviousness (see MPEP 2144.05).

7. Regarding **claims 6 and 7**, Uemura et al. also teach said bonding pad layer (123) has a thickness of 0.03 μm to 5 μm (i.e. 300 Å to 50,000 Å; col. 13 lines 55-58), which overlaps the

claimed ranges of claim 6 of at least 1,000 Å and claim 7 of 3,000 Å to 5,000 Å, and this establishes a prima facie case of obviousness (see MPEP 2144.05).

8. Regarding **claim 8**, Shibata et al. also teach a flip-chip-type gallium nitride compound semiconductor light-emitting device according to claim 1, wherein said bonding pad layer (28) is composed of gold (paragraph [0011]).

9. Regarding **claim 9**, Shibata et al. also teach a positive electrode (p type electrode 28 and 2nd reflecting layer 27; Drawing 2, paragraph [0017]) for use in a gallium nitride compound semiconductor light-emitting device (paragraph [0007]), wherein said positive electrode (28 and 27) has a three-layer structure (2nd reflecting layer 27 and p type electrode 28, and 28 can be a bilayer; paragraph [0009, 0011]) comprising an ohmic electrode layer (2nd reflecting layer 27 of Rh which forms ohmic contact; Drawing 2, paragraph [0009, 0017]) composed of rhodium (paragraph [0017]) which is brought into contact with a p-type semiconductor layer (p type layer 15; Drawing 2, paragraph [0013]) of said gallium nitride compound semiconductor light-emitting device (paragraph [0007]), and a bonding pad layer (p type electrode 28 can be Au, which is a well known bonding pad material; Drawing 2, paragraph [0011]), said bonding pad layer (28) being composed of a metal selected from the group consisting of gold, aluminum, nickel, and copper, or composed of an alloy containing at least one of these metals (Au, i.e. gold; paragraph [0011]); wherein the bonding pad layer (28) is provided atop (on top of) a portion (the portion at the right hand side) of the ohmic electrode layer (27), wherein said portion is less than the entirety of the ohmic electrode layer (27; see Drawing 2).

Shibata et al. do not teach an adhesion layer composed of titanium which is provided on said ohmic electrode layer and has a thickness of 1000 Å to 3,000 Å, and a bonding pad layer

provided on said adhesion layer, and wherein the adhesion layer has the same dimension as the bonding pad layer.

In the same field of endeavor of light emitting diode, Uemura et al. teaches an adhesion layer (second positive electrode layer 122 made of Ti; Fig. 10, col. 12, lines 43-49) composed of titanium (col. 12, lines 43-49) which is provided on said ohmic electrode layer (first positive electrode layer 121 made of Rh; Fig. 10, col. 12, lines 43-49), and a bonding pad layer (third positive electrode layer 123; Fig. 10, col. 12, lines 43-49) provided on said adhesion layer (122; see Fig. 10), and wherein the adhesion layer (122) has the same dimension as the bonding pad layer (123; see Fig. 10). Uemura et al. also teach an adhesion layer (122) has a thickness of 3 Å to 1000 Å (col. 13, line 44), which overlaps the claimed range of 1000 Å to 3,000 Å, and this establishes a prima facie case of obviousness (see MPEP 2144.05).

Uemura et al. also teach the multi-layer structure can provide a high reflectivity and a large durability against moisture, and a simplified protection layer (col. 5 lines 4-8).

It would have been obvious to one of ordinary skill in the art at the time of invention was made to combine the inventions of Shibata et al. and Uemura et al. and use the multi-layer positive electrode as taught by Uemura et al., because the multi-layer structure can provide a high reflectivity and a large durability against moisture, and a simplified protection layer as taught by Uemura et al.

10. Regarding **claim 12**, Shibata et al. also teach a light-emitting diode (paragraph [0007]) comprising a flip-chip-type (paragraph [0005]) gallium nitride compound semiconductor light-emitting device (paragraph [0007]) according to claim 1.

Response to Arguments

11. Applicant's amendments, filed 01/27/2009, overcome the objections to the drawings and the specification. The objections to the drawings and the specification have been withdrawn.

12. Applicant's arguments with respect to claims 1, 4-9, and 12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hsin-Yi (Steven) Hsieh whose telephone number is 571-270-3043. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on 571-272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lynne A. Gurley/
Supervisory Patent Examiner, Art Unit 2811

4/28/2009
/H. H./
Examiner, Art Unit 2811